



Publications

Is it possible to use "social media" in science? Can data crowdsourcing and help in analysing natural disasters? In May, a paper was published in Nature Communications, whose main author is Dr. Dariusz Baranowski from the Department of Atmospheric Physics. It is a result of observation, research, international cooperation, but also reaching for an unusual source of information: tweets from thousands of users who became a part of "citizen science"



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Latest events

New projects

The results of subsequent National Science Center competitions have been announced. OPUS, SONATA, PRELUDE BIS, GRIEG - in each of them scientists from IG PAS obtained funding.

In the case of the GRIEG competition (so-called EEA and Norwegian funds), the competition was particularly high - only 12 projects in Earth Sciences received support, including the project proposed by Monika A. Kusiak from the Department of Polar and Marine Research, testing the hypothesis that in the early archaic there was on common continent, also consisting of parts of today's Arctic and Antarctic.

As part of the OPUS project, Dariusz Baranowski from the Department of Atmospheric Physics will study tropical waves, their relationship with global circulation and the possibilities of better predicting extreme phenomena associated with rapid rainfall in the Maritime Continent. The project manager also became a laureate of the Ministry of Science and Higher Education scholarship for outstanding young scientists!

Another OPUS project, headed by Wojciech Czuba from the Department of Lithospheric Research, will facilitate the recognition of the deep structure of the lithosphere in the still insufficiently explored region of the Carpathians with tectonic objects associated with them.

As part of the PRELUDIUM BIS project, Michael Nones from the Department of Hydrology and Hydrodynamics will exchange sediment deposition modeling at the Finch dam in Ethiopia, which will provide reliable scenarios that will help manage this important catchment.

This is not the only project in the Department of Hydrology and Hydrodynamics - Magdalena Mrokowska, leader of SONATA project will learn about the dynamics of particle falling in a natural water environment with complex physical properties - a non-Newtonian fluid: water with dissolved exopolymers secreted e.g. by bacteria.

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In 2019, two of our outstanding professors retired

In 2019, two of our outstanding professors retired, prof. Roman Teisseyre and prof. Janusz Borkowski. The professors co-created this institute and created the environment of our place work, they are great authorities for us.

Professor Roman Teisseyre has been building his scientific position, international recognition and great authority for over 65 years, with persistent work for the Institute and Polish and world geophysics. He is the creator of the Polish school of theoretical geophysics. He organized the Seismology Department and the Department of Earth's Interior Dynamics. He was the deputy director and the director of the Institute for many years.

Professor Roman Teisseyre is an outstanding figure in Polish scientific life. The professor's original scientific achievements are impressive, covering almost 400 published works. He is mainly a theoretician dealing with the physics of the Earth's interior. Most of the work is associated with seismology, geodynamics, as well as thermodynamics of the process of rock deformation and destruction, but his accomplishments are very comprehensive and also include works initiating new research directions or summarizing the state of geophysical research.

He developed the dislocation theory of earthquakes, introduced into the seismology the micromorphic description of the center, which enabled him to demonstrate the existence of waves and torsional deformations associated with

earthquakes (the world's first registration of rotational waves), which entered permanently in the field of Earth physics.

It is not possible to mention all Professor's achievements. In recognition of all his merits, Professor Roman Teisseyre received a number of prestigious awards and prizes.

We all know and value very much the activities and scientific achievements of the professor Janusz Borkowski, recognized atmospheric physicist, associated with our Institute since 1979. Member of the Editorial Board of "Acta Geophysica" and the Committee of Geophysics Polish Academy of Sciences.

He is a supervisor of a number of Polish atmospheric physicists. He contributed to the development of pollution observation and atmospheric chemistry at Central Geophysical Observatory in Belsk. Between 1981 and 2008 he headed the Department of Atmospheric Physics.

Professor Borkowski is a precursor of interdisciplinary research (joining medicine and geophysics) in our Institute, examining the relationship between morbidity for zoster and the intensity of solar UV radiation. Professor's another important achievement is the homogenization of a long series of measurements of solar UV radiation from Belsk. Reconstructed measurement series is one of the longest in the world and is widely used in research on solar UV radiation trends.

In recognition of all his merits, Professor Janusz Borkowski received a number of prestigious awards and prizes.

Let us introduce the Common Room – a new space for meetings and brainstorming!

The Common Room is a creative space for scientific meetings, presentations and various types of discussions. Room, which does not resemble any other rooms in the Institute - because it is filled with comfortable sofas, numerous poufs and patterned, leafy wallpaper - is located on the ground floor, in room No. 11.

The idea of creating the Common Room appeared during works on the Communication Strategy, when the need to create a social room that would facilitate the exchange of information in an informal atmosphere was pointed out. When furnishing the room, we took into account the comfort (sofas, poufs, informal atmosphere of the interior), equipment: the room has a modern TV enabling teleconference connection and displaying presentations, a magnetic board for brainstorming results, or pinning ads, as well as possibility to make

some tea. We have also created a place for a library of inspiration - not only with science books, but also for the exchange of books or magazines.

The room also has the option of organizing larger meetings - of course, as soon as the current restrictions cease to apply.



Management's view

After the reporting meeting

Prof. Mariusz Majdański, Deputy Scientific Director

This year, reports on scientific activity of 2019 took place in a new, pandemic-forced form. For the first - and hopefully the last - time, reports have been

carried out via teleconference system. However, this onerous form was compensated by the very good preparation of presenters and session leaders. In addition, our reports were not conducted in a standard way as departmental reports (methodological), but as thematic reports focused around four main research areas of IG PAS interest. At this point, I would like to thank prof. Stanisław Lasocki (Anthropogenic and natural geohazard & environmental anthropopression), prof. Michał Malinowski (Earth structure & georesources), prof. Renata Romanowicz (Climate change & polar regions), prof. Wojciech Dębski (Geosystem Processes) and prof. Marek Lewandowski - who introduced us in two areas - for the excellent preparation and presentation of these important areas, grouping scientific research of many people. In my opinion, this new form of reporting turned out very good, and it also gained recognition among our guests from the Scientific Council and the International Advisory Board.

Interestingly, departments presented their achievements and plans in different blocks. This was particularly showed in the Geophysical Imaging (Michał Malinowski), which was presented in all four blocks, although the Department of Theoretical Geophysics, despite its achievements in 2019, presented only the activity of Piotr Klejment in one block. Presentation of activities of our observatories presented together went very well.

2019 was the year of the largest number of publications from the JCR list in the history of IG PAS (94 papers). Importantly, half of these papers are articles in the best magazines (100+ points). As in previous years, the Department of Hydrology and Hydrodynamics published the most papers (22 works for 16 employees), and the least the Department of Theoretical Geophysics (4 works for 6 employees) and Litospheric Research (1 work for 9 employees). I hope for strong papers, especially in the Litospheric Research, which is known for the largest number of citations.

Comparing to previous years we obtained less project in 2019. We received funding for 12 scientific projects, out of 39 applications (31% success rate), and 16 smaller supporting grants, out of 20 applications (80% success). We obtained two prestigious projects: Sheng (Romanowicz, Malinowski), Grieg (Monika Kusiak) and four Horizon 2020 (Beata Orlecka-Sikora, Agata Goździk). As a summary of 2019, the IG PAS Director awarded prizes (Michał Malinowski, Michael Nones, Dariusz Baranowski, Rafał Szaniawski) and distinctions (Jacek Kamiński, Marzena Osuch, Artur Szkop) to the most active scientists. The didactic activity and the launch of two doctoral schools (Piotr Głowacki, Krzysztof Kochanek, Agata Szczegieliak-Kwaśniak) and our excellent administrative support (Marcin Zimny, Grażyna Kłósek) were also awarded.

We have a year and a half ahead of us to be included in the evaluation. This is the last moment during which we can try to maintain the highest scientific category. Thank you for good achievements in 2019, and I wish you interesting

research in the coming years, as a result of which points and slots will fill automatically.

We asked moderators of 4 major blocks presented during the reporting meeting to sum up the findings and future plans.

Prof. Michał Malinowski:

The formula assuming the participation of experts from the International Advisory Board is a good idea, such meetings could take place more often. In the case of the block "Earth structure & georesources" valuable comments appeared - among others regarding possible involvement in geothermal issues, for example through cooperation with GEO8 partners. In this way, our activities would also fit into the global challenge and social needs related to energy transformation. In the area of energy generation, there are new challenges and plans for the future - related not only to renewable sources, but also to fossil fuels. According to the report of the Geological Society of London, we will remain dependent on fossil fuels, so we will continue research in this direction, but we hope to use the methods developed on our involvement in geothermal energy, as well. Currently, this approach is quite rare even on a global scale, and it has a potential to optimize the search for geothermal sources if we can determine their properties based on seismic surveys. One of the most important directions is the search for mineral resources that are key to the European economy. It will be important to continue cooperation with international partners (as in the H2020 SMART EXPLORATION project, for example). The nearest plans are therefore focused on projects, e.g. under ERA-MIN 2 or EIT Raw Materials, and the directions of activities are related to the improvement of methods of geophysical exploration of metal ore deposits.

We also want to develop broader interdisciplinary cooperation within the Institute- e.g. between the Geophysical Imaging, Hydrology and Hydrodynamics in the field of groundwater monitoring, or in the field of testing flood embankments. One of the experts from the Advisory Board, present at the reporting meeting, gave particular recognition to the activities related to the so-called Mineral System Approach, where the presence of exploitable raw materials (e.g. copper deposits) is related to the characteristics of the lithosphere - and here opens another field for cooperation with the Department of Magnetism and the Department of Lithospheric Research.

More summaries in following BULLETINS!

Prof. Beata Orlecka – Sikora:

I wish to thank all of you for all very interesting presentations, active participation in the discussions, your comments, suggestions, ideas, and also openness for new solutions. I very much appreciate the involvement of our Advisory Board and that they dedicated your time to listen to our achievements and also problems raised during these 4 days.

I am satisfied with the completed picture of our activities which has been mapped in regard to the main research topics in IGF PAS. We have highlighted our role as potential players in the fields which are also important for the whole scientific community dealing with Earth sciences. We explore and contribute towards and provide solutions to global challenges like natural and anthropogenic multihazard and risk, environmental change adaptation, and georesources management.

I see also many plans, some of them are matured enough to construct a long term research program and apply for external funding. We have entered the other level of our work in IGF, building our scientific potential in a more comprehensive way, and also I see that the strategy of internal collaboration is already in place. I am sure that soon we will benefit from these all solutions. I would expect now the follow-up from the first stage of the topic division activities in the form of the scientific strategy which will include the strategic partnership, together with the scientific communication, promotion, and educational components, as well as the data science infrastructure. And later also to see open-discussion meetings/seminars and conferences.

From the management perspective, we will support the possibilities of realization of these all plans. We have to do our best to deliver world-leading research in Earth Sciences. The evaluation of our institute will be in 1.5 years. We need to keep the momentum. We all have to strengthen our activities to pass this evaluation with the highest possible rank. The competitions are very strong, our competitors are also very active and very good. The hard task ahead of us to keep a present winner title but I think that together we are able to do it.

I wish you to take everything the best to be effective from the present way of working. Take a rest during holidays and stay healthy.

(non)Scientific op-ed

In the book published in recent months by the National Agency for Academic Exchange: "Science in Poland in 34 Snapshots", presenting leading Polish research directions and

infrastructures that have a good international reputation, you can also find information about Polish polar research and the Polish Polar Station on Spitsbergen as a high-class European research infrastructure.

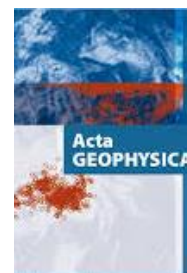
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Acta Geophysica

We invite you to read an article in latest Acta Geophysica issue:

A review on hydrodynamics of horseshoe vortex at a vertical cylinder mounted on a flat bed and its implication to scour at a cylinder.

Costs associated with bridge constructions are enormous, but the losses associated with their failure are generally bigger. In the past, many scientists pointed out that one of the key reasons behind the failure of bridges is bed scouring, which affects the stability of bridge piers in rivers. This paper proposes a comprehensive review of the local scour due to vortical flow around a cylindrical bridge pier under steady flow current, showing the mechanisms of the formation of vortices and their characteristics. The complexity involved in the scour-related calculations and the scope for future research are also discussed.



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